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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,441	12/03/2003	Paul Mueller	CH2M.07/CIP	7116
25871	7590	01/03/2005	EXAMINER	
SWANSON & BRATSCHUN L.L.C. 1745 SHEA CENTER DRIVE SUITE 330 HIGHLANDS RANCH, CO 80129			FORTUNA, ANA M	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/727,441

Applicant(s)

MUELLER ET AL

Examiner

Ana M Fortuna

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-15 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-10 and 16-23 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 11, 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/3/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. Claims 1, 2, 3, 6, 7, 8, 9, 10 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 3, 5, 6, 7, 8, 9 of U.S. Patent No. 6,783, 683. Although the conflicting claims are not identical, they are not patentably distinct from each other because all the limitations of the claims in the present invention overlap the limitations of the claims in the patent. The broad limitation of claims in the application, e.g. directed to treatment of "fluid", overlap "drinking water".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 16-18, 20-21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley (6,372,143) (hereinafter '143) in view of Davis et al (4,207,397)(hereinafter '397). Thoraval (6,464,881)(hereinafter '881).

Reference '143 discloses a process including the steps of treating a fluid with a resin tower (11), e.g. cation exchange resin, directing the fluid from the resin treatment to a tank containing a membrane, e.g. housing of membrane (23), removing the fluid through the membrane, and regenerating the resin (elements 20, 19, 18). Up-flow is not

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clearly disclosed, however, the raw or produced water inlet is not directed from the top of the column or container containing the resin, and the regenerant is directed to the top of the container or column (11). It would have been obvious to one skilled in the art at the time the invention was made to select up-flow or down-flow resin columns or towers, since it does not seem to be critical to the ion exchange process. '143 fails to disclose reusing regenerant and filtering the regenerant. Reference '143 discloses cation resin (column 3, lines 21-52, column 5, lines 55-68, column 6, lines 1-43). Reference '397 teach a process including using cation exchange water softener, regenerating the water softener, and further treating and recycling the regenerant (abstract). Regenerating the column, e.g. up-flow (column 5, lines 32-41, column 50-55), with brine, and filtering the used brine regenerant to a separation unit (34), which includes a filter (column 6, lines 3-19).

As to claim 18, It would have been obvious to one skilled in the art at the time the invention was made to use a cation exchange tower or packed bed for treating a fluid, e.g. water, or rinse solution, and regenerate the column with conventional regenerant for cation exchanger, depending on the type of contaminants present in the fluid which are retained by the resin, it would have been obvious to use brine, as suggested by '397 for cation exchange material, and further regenerate the brine by filtration, and further reuse in the regeneration process, as suggested also in '397.

Regarding claim 20, retaining the resin in the tank or tower is disclosed in the references discussed above. as to claim 21, the resin and the regenerant are mixed, or in closed contact inherently, during the regeneration by injecting the regenerant into the

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tank or tower containing the resin (element 11). As to claim 23, adjusting the resin container of the tank or tower after several reuse of the resin to make up for any lost resin during the it would have been obvious to one skilled in the art at the time the invention was made, in particular in towers where not prevention of draining of the resin is provided.

4. Claims 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cote et al (5,932,099) in view of Davis et al (4,207,397)(hereinafter '397) and Thoraval (6,464,881)(hereinafter '881) or Jangbarwala (6,776,913)(hereinafter '913). Cote et al discloses treating a fluid within a tank, depositing ion exchange resin within the tank, removing the fluid through a membrane immersed in the fluid within the tank (figure1, elements 10, 7, 11, 12, column 6, lines 30-68, column 7, lines 1-19).

Regenerating the resin, recycling regenerant and recovering regenerant by membrane is not disclosed in cote et al ('099). Reference '397, discussed in the paragraph above, discloses regenerating a resin, e.g. with brine, and regenerating the regenerant by filtration, and recycling the regenerant back for regeneration of resin deposited within a tank or column; filtering the regenerant is also disclosed (column6, second paragraph). Filtering with membrane is not disclosed.

Reference '881 teaches filtering a brine regenerant with a nanofiltration membrane, to regenerate the brine for reuse (abstract, column 1, lines 65-68, column 2, lines 1-18). It would have been obvious to one skilled in the art to regenerate the resin in tank (7) in cote et al., e.g. with brine solution, and further separated remove the brine from the tank and regenerate the brine by filtration, or nanofiltration, as suggested by '397, and '881,

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in particular when cation exchange resin is added to remove inorganic material from a fluid or water, which resin can be regenerated by a brine solution of, e.g. sodium chloride.

Regarding claim 22, reference '913 teaches rinsing the resin after regeneration, e.g. to remove remaining regenerant from the resin (column 13, lines 46, through column 14, lines 1-12 (claim 17)).

Allowable Subject Matter

5. Claims 4, 5, 11 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 13-15 are allowed over the prior art of record. The prior art of record fails to disclose providing the up-flow bed within the membrane tank containing the membrane, e.g. immersed membrane, and the regeneration of the resin in the portion of the tank containing the up-flow bed.

7. The following is a statement of reasons for the indication of allowable subject matter: the combination of limitations of the above claims is not suggested by the prior art of record.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Additionally cited references are directed to processes including

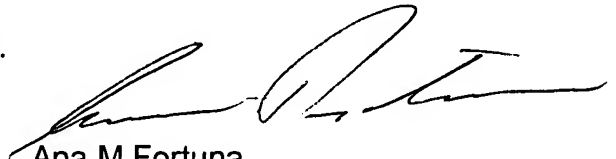
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ion exchange prior membrane filtration, regeneration of ion exchange material and reuse of regenerant.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ana M Fortuna
Primary Examiner
Art Unit 1723

AF
December 27, 2004